AI 1103 : Probability and Randomm Variables

ASSIGNMENT 1

AI20BTECH11026

Solution 1.1:

Let the random variable $X = \{0, 1\}$ denote the outcome of the given experiment.

$X = 1$ if the marble picked turns out *Green*.

$X = 0$ if the marble picked turns out *Blue*.

It is given that,

$$P(X = 1) = \frac{2}{3}$$

$$\therefore P(X = 0) = 1 - P(X = 1)$$

$$\therefore P(X = 0) = 1 - \frac{2}{3}$$

$$\therefore P(X = 0) = \frac{1}{3}$$

Now,

$$n(X = 0) + n(X = 1) = 24$$

$$\because P(X = 0) = \frac{n(X = 0)}{n(X = 0) + n(X = 1)}$$

$$\therefore n(X = 0) = P(X = 0)\,(n(X = 0) + n(X = 1))$$

$$\therefore n(X = 0) = \frac{(1)(24)}{3}$$

$$\therefore n(X = 0) = 8$$

$\therefore$ Theoretical number of blue balls is 8.